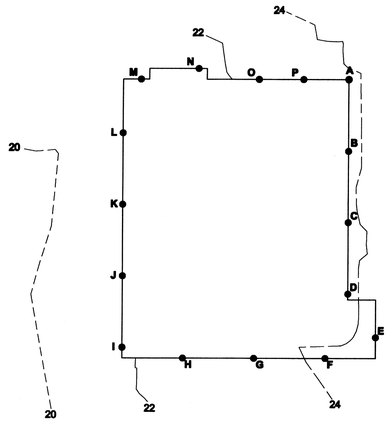
Jewell Residence
File Number: 12-103804-LS and 12-104512-LO



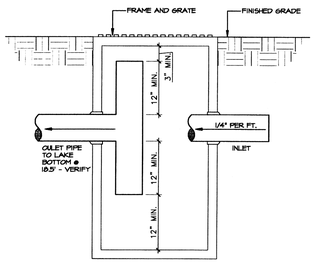
POINT ELEVATIONS
A = 23.8
B = 23.6
C = 23.3
D = 23.1
E = 24.6
F = 24.2
G = 23.3
H = 22.6
I = 20.3
J = 20.5
K = 20.5
L = 20.7
M = 21.2
N = 21.7
O = 22.4
P = 23.1

TOTAL A-P: 358.9
358.9/16 = 22.43 AVERAGE BUILDING ELEVATION

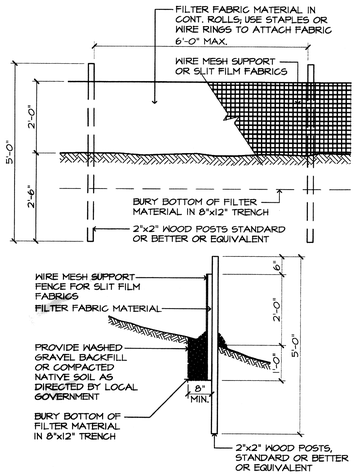
MAX. ALLOWED BUILDING HEIGHT = 22.43' + 35' = 57.43'

PROPOSED MAXIMUM RIDGE HEIGHT = 53.4'

BUILDING HEIGHT CALCS
SCALE 1" = 10'



CATCH BASIN WITH OIL/WATER SEPARATOR
(2) SCALE NTS



FILTER FABRIC FENCE DETAIL
(1) SCALE NTS

LEGAL DESCRIPTION
LOT 3, PLEASURE POINT PARK UNRECORDED.

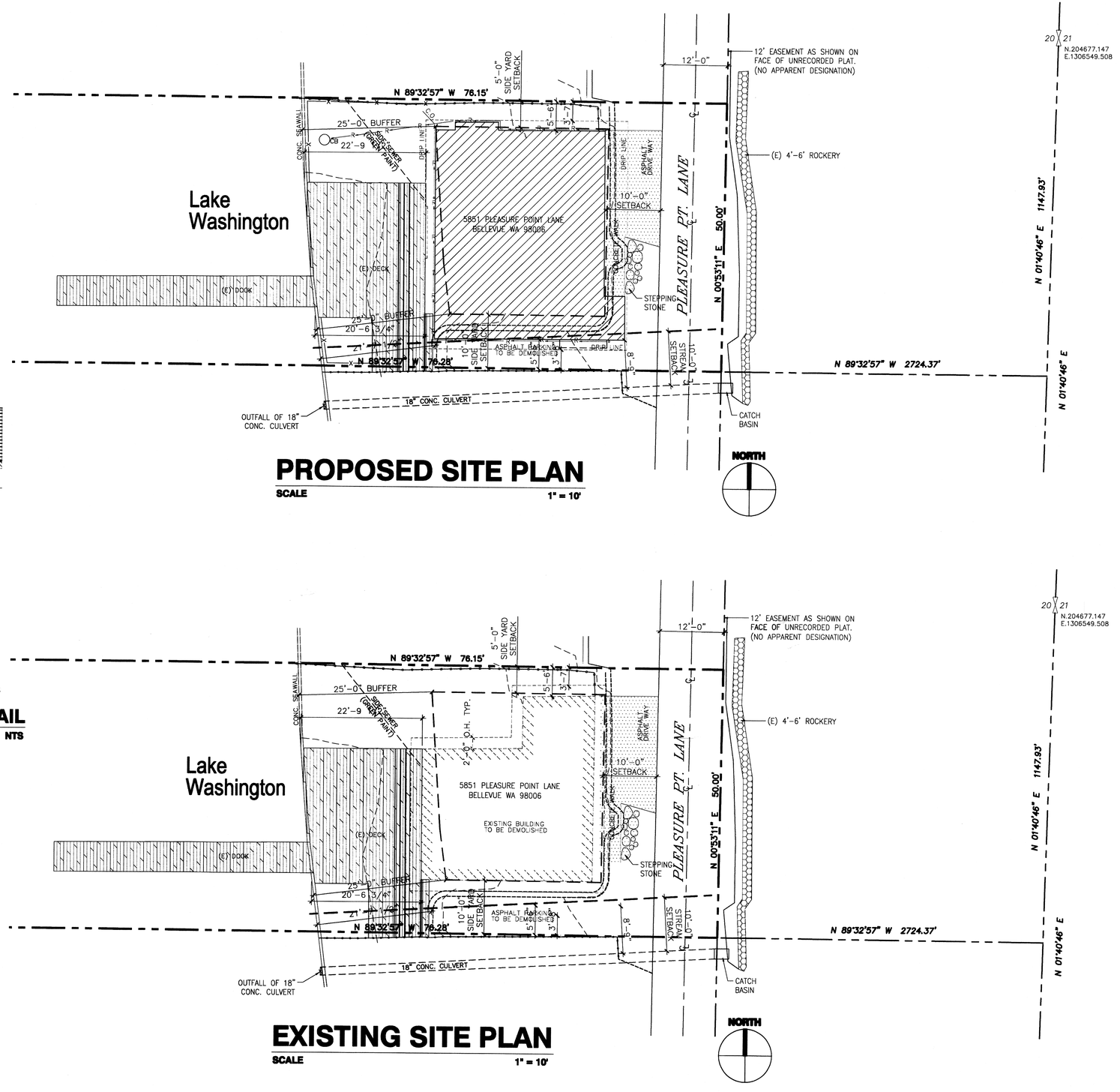
TAX PARCEL NUMBER: 6828100020

SITE COVERAGE
EXISTING LOT AREA: 3,886 SF

BUILDING FOOTPRINT (DRIPLINE): 1,613 SF

1,613/3,886 = .415 = 41.5%

INDEX OF DRAWINGS



PROPOSED SITE PLAN
SCALE 1" = 10'

EXISTING SITE PLAN
SCALE 1" = 10'

ANTONIO D'AMBROSIO
Architect AIA

3712 East Mercer Way
Mercer Island, WA 98040

Phone: 206.232.6923
Fax: 206.232.8279

4043 REGISTERED ARCHITECT
ANTONIO D'AMBROSIO STATE OF WASHINGTON

JEWELL RESIDENCE
5851 PLEASURE POINT LN BELLEVUE, WA 98045

Drawing Title: SITE PLANS

Drawn By: M.D.
Checked By: T.D.
Approved By: T.D.

Issue Date: 12-12-11

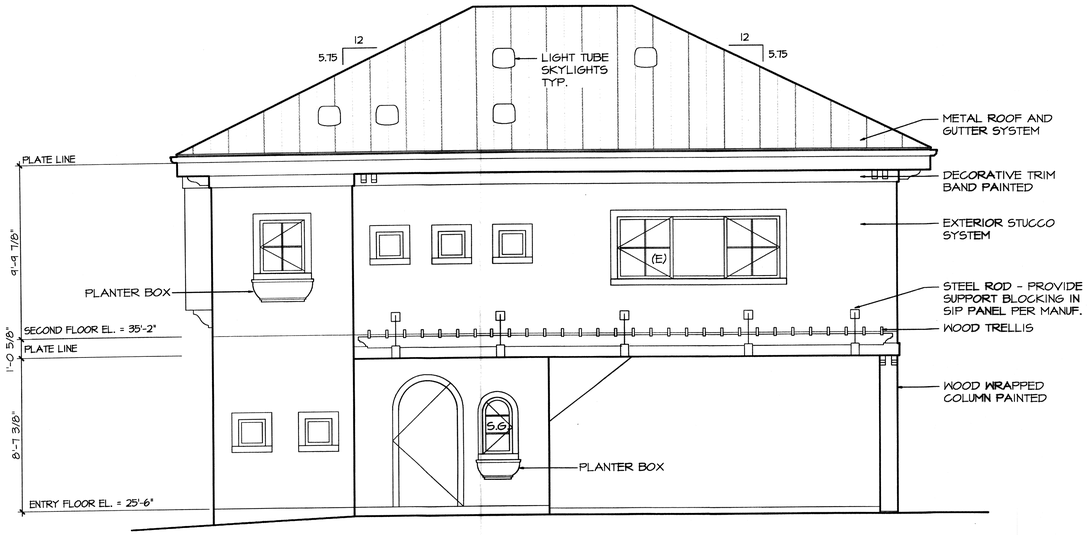
Revisions:

No.	Description	Date

Received JAN - 5 2012 Permit Processir

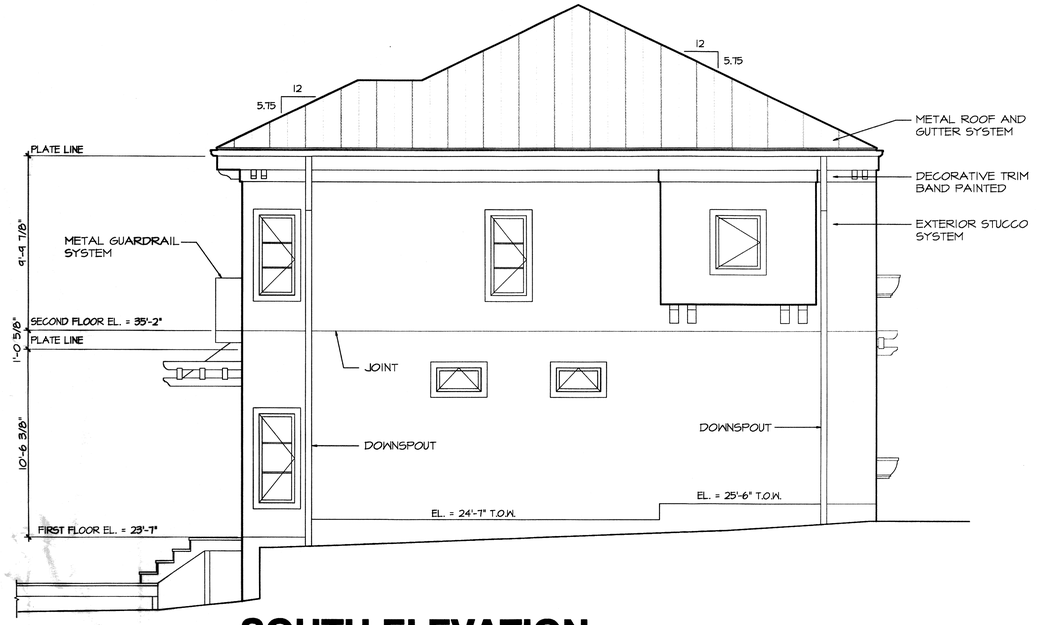
Scale: 1" = 10'-0"

Sheet No. A1



EAST ELEVATION

SCALE 1/4" = 1'-0"

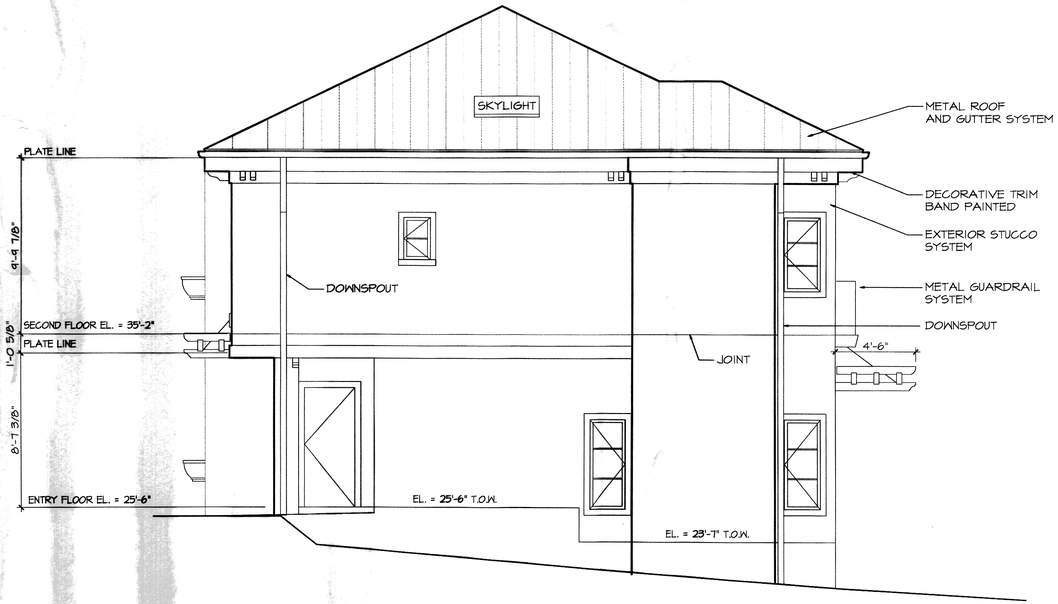


SOUTH ELEVATION

SCALE 1/4" = 1'-0"

WEST ELEVATION

SCALE 1/4" = 1'-0"



NORTH ELEVATION

SCALE 1/4" = 1'-0"

ANTONIO D'AMBROSIO
Architect AIA

3712 East Mercer Way
Mercer Island, WA 98040

Phone: 206.232.6923
Fax: 206.232.8279

4043 REGISTERED ARCHITECT
ANTONIO D'AMBROSIO
STATE OF WASHINGTON

JEWELL RESIDENCE

5851 PLEASURE POINT LN
BELLEVUE, WA 98045

Drawing Title: ELEVATIONS

Drawn By: M.D.
Checked By: T.D.
Approved By: T.D.

Issue Date: 12-12-11

Revisions:

No.	Description	Date

Received
JAN - 6 2012
Permit Processing

Scale: 1/4" = 1'-0"

Sheet No.

A6

MICHAEL K JEWELL

1020 88TH AVENUE NE
BELLEVUE, WA 98004
425 301 8978

TO: City of Bellevue land Use Department
FROM: Mike Jewell; Jewell Residence
DATE: **January 5, 2012**

SUBJECT: Property located at 5851 Pleasure Point Lane SE, Bellevue WA 98006. Zone R5 Replace single family wood construction 1928 home in poor condition on small 3,889 square foot non-conforming lot with 50 feet on Lake Washington with new single family residence. New residence requires modest setback variances.

This letter will address the criteria set by the City of Bellevue for variances:

1. Front yard setback from roadway easement to structure. There will be a 10 foot setback on the northeast structure corner and 6.25 foot setback on the southeast structure corner.

2. North side yard setback will be 5 feet 6 inches from the building foundation to the property line. South side yard setback will be 5 feet 6 inches from the building foundation to the property line.

3. South side yard structure setback is impacted by a small 75 foot drain pipe on neighbor's property which is 18 inches in diameter and used occasionally for rain runoff to lake with no plant of fish life. The new single family structure will be 8 feet 9 inches from the storm drain on the southeast structure corner and 10 feet 9 inches on the southwest structure corner. The storm drain pipe is on the neighbor's property to the south and is at an angle moving away from our property. Please see Boundary Survey for pipe location

Property Description

The property is a non-conforming lot zoned R5 and has been recently surveyed at 3,889 square feet. The property has an 890 square foot single family wood construction home that was built in 1928 and is currently in poor condition. The property was once an unincorporated area annexed by the City of Bellevue. The lot has 50 feet on Lake Washington facing west. The first 600 square feet of the property's east side is part of the neighborhood access road easement. To the north and south side of the property there are 2 story single family residences. A copy of the recent survey is attached.

Current Objective

We plan to build a new single family residence. The layout is essentially the same with the kitchen, living room, entry and dining room all in the same locations as the original home. We however need to move the bedrooms upstairs to provide for a carport. The residence was originally built in 1928 prior to the need for larger automobile carports and garages and the access road was not designed for parking. The new carport would be placed where there is currently the main bedroom and bathroom and drain rock gravel area with paver blocks.

The property's primary structure and asphalt area represents 62% of the property including the entire front yard and nearly all of the south side yard. The structure has a failing asphalt shingle roof and property's poor water drainage system is negatively impacting the neighborhood, wildlife and lake.

We plan to make improvements in all these areas and install one of the first LEED certified/net zero homes in the City of Bellevue. Current plans are for one foot thick exterior walls with an R38 rating and an R47 rated ceiling with standing seam steel roofing instead of the current asphalt shingle roofing (improves water quality to the soil and filtration to lake). Windows will be high efficiency triple pane with built in thermal breaks to reduce energy loss. A water/oil separator system is planned for water run off from existing road. Solar panels are being considered for photovoltaic and for water heating (either solar collector or evacuated tube). The angle of the roof has been designed to maximize the solar efficiency. LED lighting is planned for the majority of the residence, as well as passive solar tube and natural lighting to reduce energy costs. In addition, a heat recovery ventilation system will be installed HRV. Window locations, native plants and eaves have been designed to maximize passive solar heating in the winter and minimize solar sunlight heat gain in the summer. Trellises have been designed to assist with this passive energy savings for summer periods. House foundation will have rigid foam insulation with cement on each side of the rigid foam as part of the home's thermal envelope. Radiant floor heating is being considered supported by solar panels for electricity. Blower door tests will be completed three times during construction to assess thermal efficiency.

Home layout will be functionally similar to current location of kitchen, living area, dining area and entry with bedrooms moving upstairs to allow for a carport to accommodate 2 cars. We believe the addition of a carport is necessary due to the property's small lot size, narrow neighborhood private road access easement and area's current poor parking facilities. No parking is allowed on the private road access easement as it would block residential access. In addition it is nearly impossible and dangerous for a car to turn around on the current property due to the property's small lot size, narrow road and location of access road easement. Over the past 15 years, newly constructed homes on Pleasure Point Lane have resolved this problem by adding a car garage.

The new plan for the property will be a higher and better zoning use, will positively impact the environment, will improve natural water runoff filtration going into the lake and potential erosion. We also plan to restore native plant life along the lake. Our plan will be aesthetically pleasing and will enhance the natural beauty of the property and neighborhood.

Below are the modest variances needed to accomplish the above:

Front Yard Setback:

We will need to reduce the required front yard setback, from the roadway easement to the structure. The northeast structure corner setback will be 10 feet and the southeast structure corner will be 6.25 feet. Access to the property is via a 12 foot wide roadway easement which dead ends approximately 130 feet south of the property. There are 2 residences to the south of our property. It should be noted the neighboring structure directly adjacent to the south of our property at 5855 Pleasure Point Lane actually touches the access easement on their southeast structure corner. At the midpoint of this structure the residence is less than one foot from the roadway access easement and is less than 6 feet from the roadway access easement on the northeast structure corner. The next house to the south has a City of Bellevue approved 3 foot distance from the roadway and their structure.

There will be architectural wood trellises and/or roof eaves over sections of the front of the building between the first and second floor and a protective eave surrounding the second floor. These trellises and eaves will not exceed 18 inches in depth. All sides of structure will have 18 inch eaves at the roofline for weather protection. This is consistent with neighboring homes.

The residential community along Pleasure Point Lane and neighboring Hazelwood Lane was established prior to current Land Use regulations. The majority of the residences along these private lanes intrude into the required front yard setback due to the narrow lot sizes and narrow shared roadway easement. For example the distance between these structures and the front yard access easement road vary from "0" feet to 14 feet.

1. #1 South: The neighboring structure directly adjacent to the south of our property at 5855 Pleasure Point Lane actually touches the access easement and therefore has no setback.

2. #2 South: The neighboring structure 60 feet to the south of our property that was built in 2003 at 5859 Pleasure Point Lane has a 3 foot distance between the roadway and structure as approved by the City of Bellevue.

3. The neighboring structure 60 feet north of our property at 5841 Pleasure Point Lane received an 8 foot setback variance from the access easement.

4. The neighboring structure 100 feet north of our property that was built in 2005 at 5837 Pleasure Point Lane received an 8 foot setback variance from the access easement.

This information is provided to demonstrate that the request for this front yard variance does not constitute a grant of special privilege inconsistent with the limitation upon use of other properties in the vicinity and land use of the subject property. In addition we believe this 6.25 foot setback on the southern side of our property (only for 8 feet 6 inches in length of the 39 foot in length building) and 10 foot setback on the northern end our property will enable a car to park in front of

the home without impacting cars passing by on the adjacent roadway easement. We consider this an important issue for neighborhood safety and auto access.

Side Yard Setbacks:

Our single family residence will have a 5 feet 6 inches north side yard setback. This is needed to allow for a 3 bedroom 1,942 square foot living area single family residence. This north side of the structure will have an 8 foot 10 inch wide minor building element from foundation to the second floor roof line. On the first floor this will be the fireplace area in the living room. On the second floor this will be a fireplace vent and possibly bookshelf area. The area will be 18 inches in depth.

The south side yard setback will also be 5 feet 6 inches. There is a buried cement storm drain pipe 18 inches in diameter on the property to the south. This storm drain has been researched by the City of Bellevue's Utilities department by Robert Lombard, Utility Review Coordinator Engineering Division. The storm drain pipe is recorded by the city as a Level O stream (also listed as Level 5). This is the lowest ranking level as it does not have any plant or fish life and is only occasionally in use during heavy rain storms. Storm water is fed into this 75 foot long cement pipe from corrugated metal piping which drops 8 feet into a roadway culvert and runs from the roadway easement to the lake. Our southeast structure corner will be 8 feet 9 inches from the drain pipe. Our southwest structure corner will be 10 feet 9 inches from this drain pipe. A Critical Area Report has been submitted from David Evans and Associates which references this storm drain pipe.

The southwest structure corner will have an 8 foot 10 inch wide minor building element. This area will only be on the second floor and will be used as part of the residence home office bookshelf and window area to enable a view of the lake. It will be 18 inches in depth. The attached property survey shows the location of this storm drain and setback lines. We have also provided building location for the first and second floor minor building elements.

Structure Height:

AFG not height

The single family structure height will be 22.43 feet as calculated using the City of Bellevue methodology. All calculations are provided on the Site Plan including building specifications. The height is required to allow for a 2 story structure with a 15 inch thick R46 rated roofing/ceiling, a foundation utilizing energy efficient raised flooring incorporating a layer of rigid foam between cement layers and a roof with southern and western facing height/angles optimized for solar panels.

This single family structure height is consistent with neighboring homes.

1. The property immediately to the south at 5855 Pleasure Point Lane is a 2 story structure and has a structure height of 20 to 25 feet depending on the location of the roof calculation.

2. The property immediately to the north at 5847 Pleasure Point Lane is a 2 story structure and has a structure height of 21 feet.

3. More recently the new home 60 feet to the south of our property at 5859 Pleasure Point Lane is a 2 story structure built in 2003 and has a 24 foot average finished grade height depending on location of roof height calculation.

4. Fifty feet north of our property the 5841 Pleasure Point Lane property is a 2 story structure built approximately 15 years ago and has a 25 foot average finished grade height.

5. The next residence 120 feet north of our property on 5837 Pleasure Point Lane is a 2 story structure and has a 24 foot five inch average finished grade height.

6. The next residence 170 feet north of our property on 5831 Pleasure Point Lane is a 2+ story structure with an average finished grade height exceeding 30 feet.

7. The next residence 230 feet north of our property on 5825 Pleasure Point Lane is a 2+ story structure with an average finished grade height exceeding 30 feet.

8. The proposed structure height is consistent with and in many cases less than neighboring homes. In fact this property is the only single story home within a couple hundred feet in either direction. These homes are 2 and 3 story structures. Some of these homes were built within the last 15 years on non-conforming lots.

9. The location of the new structure will not block views from the adjacent homes to the north and south as these homes are 6 feet to 8 feet closer to Lake Washington than our planned single family residence.

10. The proposed building height will have no impact to the property adjacent to the east. This property was once owned by Burlington Railway and is currently a sloping hill with trees and natural vegetation. No community single family residences are located to the east of our property.

Summary:

The variance requests for our property at 5851 Pleasure Point Lane SE is in keeping with the existing variances previously approved for Pleasure Point Lane SE properties.

Our proposed building height is consistent with current neighborhood homes. Our requests do not constitute a grant of special privilege inconsistent with the limitation upon use of the other properties in the vicinity and use of the subject property.

We believe the 5 foot 6 inch side yard setbacks to the north and south is consistent with the neighboring homes and is needed due to the small 3,889 square foot lot size, proximity of Lake Washington and proximity of the roadway easement. Even with this 5 foot 6 inch side yard setback

our single family residence will be one of the smallest homes in the neighborhood with 1,942 square feet of living space.

Our request for 6.25 foot setback on the south east corner of our foundation and 10 feet on the north east corner of our foundation to the roadway easement is consistent with the neighborhood. This is due to the small lot sizes, proximity to the road easement and proximity of Lake Washington. These residences range from "0" feet to 14 feet from the roadway easement.

We are available discuss any of the above and provided materials for our new single family residence located at 5851 Pleasure Point Lane SE.

Sincerely,

Mike Jewell
425 301 8978

Items provided with this letter:

- Submittal Requirements Chart
- Application for Land Use Approval
- "Bill To" Form
- Boundary and Topographic Survey
- Site Plan showing side yard and front yard setbacks
- Architectural building Plans
- Floor Plan provided on building plans
- Building elevation calculations provided on building plans
- Statistical Information Sheet
- Narrative Addressing Variance Criteria
- Appendix A Site Photographs and Site Location
- Critical Area Report

APPENDIX A:
Site Photographs

Figure 1. Southern side of the residence, from Pleasure Point Lane SE facing west. Asphalt and boarding covering paver stones to be removed.

Figure 2. Northern side of the residence, from Pleasure Point Lane SE facing west.

Figure 3. East side of the house on Pleasure Point Lane SE to have improvements.

Figure 4 Unnamed drain, entering a catch basin on Pleasure Point Lane SE. City has this recorded as a level 5 or "O" which means no fish or plant life.

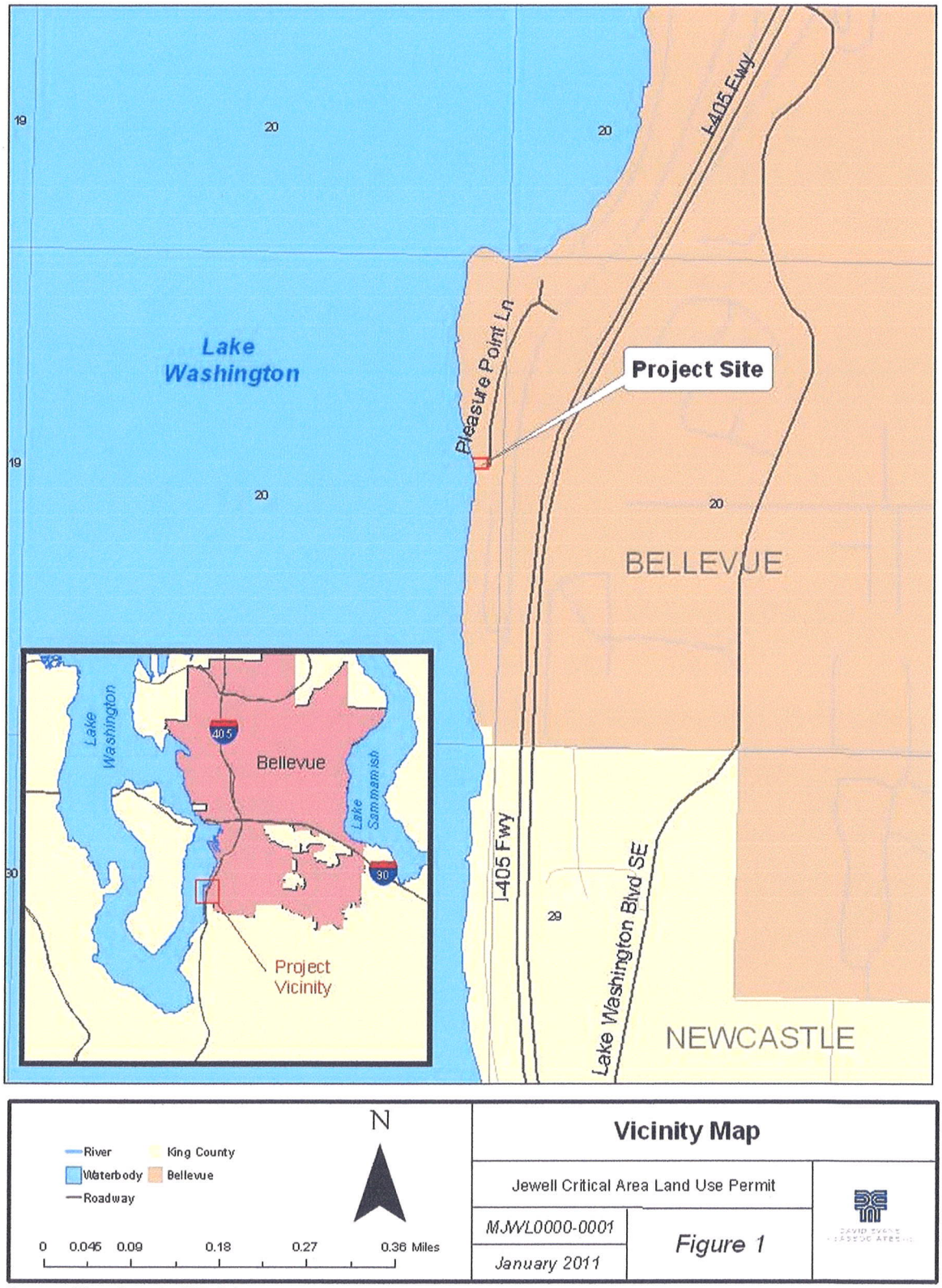
Figure 6 Residence adjacent on the south side.

Figure 7 View of 2 and 3 story single family residences on the north side.

Figure 5 Residence adjacent on the north side.

Figure 8 View of 2 and 3 story single family residences on the south side.

Figure 9 Location of single family residence



Source: King County GIS data

Figure 10 Detailed Location of single family residence

Battermann
Geotechnical
Consulting
PLLC

January 12, 2011
Revised October 18, 2011
Project No. 11001

Subsurface Exploration and Geotechnical Engineering Report Jewell Residence 5851 Pleasure Point Lane SE Bellevue, Washington

Introduction

The purpose of this study was to gain subsurface information and perform geologic and geotechnical engineering reconnaissance to be utilized in the design and development of a replacement residence of the existing single-family residence at the subject property. This report was prepared for the specific use of Michael Jewell and his agents for specific application to this project. It is our understanding that the existing single family residence will be demolished and a two story, wood frame residence over a concrete foundation with a slab-on-grade floor will be developed on the property. A topographic survey prepared by M. W. Marshall, PLS of the existing property was provided for our use in the preparation of this report.

Site and Project Conditions

The property was located at 5851 Pleasure Point Lane SE in Bellevue, Washington. The small approximate 50 by 76 foot lot was sandwiched between Pleasure Point Lane SE and the Burlington Northern railroad tracks on the east and Lake Washington to the west. Single family residences (also on relatively small lots) bound the property to the north and south. The lot had a very slight slope down to the west. Total elevation change across the lot from Pleasure Point Lane SE to the lake was on the order of 5 feet. There was no standing or flowing water onsite. There was an open half pipe extending down the BN railroad slope to a catch basin and culvert that drains across the neighboring property to the south to discharge into the lake. There was no vegetation onsite. Asphalt covered the south and east sides of the property with beauty bark and bare soil exposed on the north and northern portion of the west yards. The majority of the west yard between the house and the lake consisted of a wood deck. An approximate 4 foot high concrete bulkhead provided a hard border between the lake and the lot. An approximate 5 foot high rockery formed the border between Pleasure Point Lane SE and the slope up to the BN railroad tracks. The rockery was in good condition with no visual evidence of distress. The slope up to the railroad tracks was covered with Ivy, scrub brush, and a few large deciduous trees. There was no observed evidence of past slope failures of this approximate 20 foot high slope.

Current development plans call for the removal of the existing single story structure and replacement with a two-story residence. The foot print will be nearly in the same location as due to the small lot

size there is no alternative. The existing house has a notch out of the northwest corner of the roughly square footprint but the new house foot print will not include the notch. The new structure is planned to be two stories in height over a slab-on-grade foundation. The new house is planned to include numerous energy efficient systems and will also strive to increase the runoff quality of the current storm water discharge from the lot to the lake. Minor setback variances will be necessary to develop the planned house on the small lot. From a geotechnical engineering standpoint, the minor encroachments into the existing setback limits will not have an impact on geologic hazards or environmental conditions from the current development. The goal of the planned development is to positively impact the current conditions.

Subsurface Conditions

Subsurface conditions on the property were inferred from visual reconnaissance of the property, a review of an applicable geologic, and a series of 2 subsurface exploration borings excavated on the north and south sides of the existing residence. The exploration borings were completed using a small track mounted drill rig was performed by Geologic Drill by advancing 3 1/4 inch I.D. hollow stem auger. Standard penetration test data (ASTM D-1586) were obtained at 2.5 and 5 foot intervals with a two (2) inch O.D. split spoon sampler driven by a 140 pound hammer free-falling thirty (30) inches. The number of blows required to drive the sampler the final twelve (12) inches of the sample interval, or to refusal, is termed the "Standard Penetration Resistance" (N), and is an approximate measure of the in-situ relative density or consistency of a soil. The resistance values (N) are plotted of the left side of the accompanying boring logs. The exploration borings were logged by a licensed geologist and immediately backfilled. The exploration borings were located in the field based on visual reference and taping from features shown on the topographic map/site plan. The approximate exploration boring locations are depicted on the Site and Exploration Plan attached to this report.

Exploration boring (EB) logs of the completed explorations are attached to this report. The subsurface conditions consisted of a minor amount of fill soil or previously disturbed earth overlying a thin layer of beach alluvium over pre-Vashon aged fine grained sediments.

Stratigraphy

The upper soils in both explorations were comprised of topsoil or fill soil. An approximate 2 inch layer of asphaltic concrete pavement was at the surface in EB-1. The fill soil was comprised of previously disturbed soil from the underlying parent sources of beach alluvium, likely from the foundation excavation for the existing residence. The fill generally consisted of loose to medium dense, moist, grey-brown, medium sand with some small gravel and organic fragments. The fill in both explorations was judged to extend to a depth of 1.5 to 2.5 feet.

Underlying the previously disturbed soil were native beach alluvial sediments. The beach alluvium consisted of loose to medium dense, moist, grey, medium sand with some small gravel. The beach deposit extended to a depth of 5 to 6 feet below existing ground surface in both explorations. The beach sand and gravel was deposited by stream runoff entering the shore of historic Lake Washington.

Underlying the beach alluvium sediments were sediments consisting of stiff to very stiff with increasing depth, moist, grey-tan to blue grey with depth, silty clay and clayey silt. These sediments extended beyond the 21.5 foot depth of both explorations. The fine grained sediments were deposited in a lacustrian environment and subsequently over-run and consolidated by the Vashon ice

sheet. The sediments were then weathered to a less stiff condition due to being submerged under historic Lake Washington.

Ground Water

There were no ground water seepages encountered in the exploration borings at the time of our field explorations. Runoff water that does not enter the storm system infiltrates though the top soil or surficial fill and beach alluvium soil and becomes perched atop the consolidated fine grained sediment and flows laterally to the lake. The flow volume and height of the perched water will vary with seasonal rainfall. However, because of the small lot size and the majority of the runoff falling on hard surfaces that discharge to the existing storm water system, there was no observed perched water in our explorations. It is likely that most storm water falling on the site enters the lake as direct discharge. We also understand from a neighbor that there is an upslope interceptor drain that has been installed under the street or rockery at the east side of the property. Ground water is not anticipated to be a factor in the planned development.

Geologic Hazards

The following discussion of potential geologic hazards is based on the visual reconnaissance of the site, the subsurface explorations, and a review of aerial photographs and regional topographic maps of the area.

Steep Slope and Landslide Hazards

The slope between the BN railroad tracks and Pleasure point Lane SE is classified as a steep slope hazard area in accordance with the City of Bellevue's Critical Area Ordinance. The slope is taller than 10 vertical feet and steeper than 40 percent inclination. However, no disturbance of this slope is planned with this development. The replacement of the existing house below the slope and on the other side of the street will not have an impact on the existing stability of the slope. No slope mitigation is necessary or required. There was no visual evidence that this slope has experienced any past slope movement other than natural soil creep. The slope was significantly shorter than the typical slope length necessary to generate a debris flow type failure and the BN railroad and nearby interstate disrupt and control the upslope drainage basin storm water runoff. Therefore, it is our opinion that the potential for a slope failure to impact the property is low.

Erosion Hazard

The onsite soils in the development area have a low erosion potential due to lack of slope on the property. The proper use of "best management practices" BMPs should be used during development of the project to minimize the potential for erosion and sediment transport. The following is a partial list of BMPs that should be implemented as part of an erosion control plan for the project.

- Keeping all exposed soils covered when not actively worked
- Scheduling earth work activities during dry conditions
- Establish temporary/permanent vegetation as soon as possible after foundation installation and utility hook-up.

With proper implementation of best management practices and common sense, the property may be developed without significant erosion or sediment transport.

Seismic Hazard

Generally, there are four types of potential geologic hazards associated with large seismic events: 1) surficial ground rupture; 2) seismically induced landslides; 3) liquefaction; and 4) ground motion. The potential for each of these to impact the site is discussed below.

The property lies within the accepted trace of the Seattle fault zone. Fault zones in the Puget Sound region are currently being studied by the United States Geological Service (USGS) and have been determined to be active and capable of producing large earthquakes. Much is still to be learned about these fault systems but it is generally hypothesized that their recurrence interval is several thousand years. Due to the suspected long recurrence interval and the uncertainty of where the next surface rupture may occur, the potential for surficial ground rupture is considered to be unpredictable and no mitigation is possible or necessary.

Based on the dense, consolidated nature of the glacial and non-glacial sediments underlying the property and nearby short slope segment, the risk of a seismically triggered landslide is considered to be low.

Liquefaction is a condition where saturated loose sands lose their internal strength under high intensity cyclic loadings such as occur during earthquakes. Based on the stiff to very stiff characteristic of the fine grain sediments and their lack of pore space voids, it is our opinion that the risk of liquefaction on this site is low.

Seismic hazards that will affect the house will be due to the intensity and duration of the ground shaking. Based on the encountered stratigraphy, structural design of the project should be consistent with 2009 *International Building Code* (IBC) guidelines. In accordance with Table 1613.5.2 of the 2009 IBC, the subject site would be classified as Site Class D.

Geotechnical Engineering Recommendations

From a geotechnical engineering standpoint, the property is considered to be suitable for the planned replacement of a single family residence. The medium dense sand and stiff to very stiff silt and clay at depth will provide suitable foundation bearing support for the planned residence. We understand that in order to minimize potential differential settlement and to avoid having to place structural fill to raise the foundation up out of the influence of high ground water elevations that a pin pile supported grade beam foundation has been chosen to provide support for the new residence rather than a conventional spread footing. Steel pipe piles will be driven to refusal into the underlying sediments to provide suitable foundation support for structural grade beams. BGC, pllc will be available to provide geotechnical engineering special inspections during the development of the project and will address any unanticipated geotechnical conditions should they occur.

Site Preparation

Site preparation for construction of the planned new development will consist of removal of the existing structure. Excavated soil from the foundation area that will not be re-used as backfill should be removed from the site. All current utilities that will not be part of the existing development should be removed or otherwise properly abandoned in accordance with the type of utility.

Temporary cut slopes into the beach sand and gravel for installation of new foundation and utilities should be sloped back to a 1.5H:1V inclination or use a trench shield during installation. Cut slope inclinations may be adjusted in the field to suit the weather and soil conditions at the time of excavation. Soil to be re-used onsite should be covered with plastic sheeting to reduce the potential for erosion and sediment transport and to maintain the water content of the excavated soil.

Foundations

Foundation support for the new residence will be provided by driving 3 inch diameter, schedule 40, galvanized steel pipe piles to refusal into the underlying very stiff silt and clay sediments. A structural grade beam will be cast atop the steel pipe piles to provide a foundation base for the planned new structure. Refusal of the steel pipe piles is defined as less than 1inch of penetration during 30 seconds of continuous driving with a track mounted air hammer. Each pipe pile driven to proper refusal will be capable of providing 10 kips of vertical load resistance. Steel pipe piles do not provide lateral support so lateral support will need to be provided by the horizontal component of the load resistance of battered piles. BGC, pllc should perform foundation installation monitoring during the installation of the steel pipe piles in order to verify that the piles are driven to suitable refusal in accordance with the recommendations in this report.

Floor Support

The residence will utilize a slab-on-grade floor construction. The native floor area soils should be compacted in place once the perimeter grade beams have been cast. Structural fill should then be placed and compacted in 8 inch loose lifts to a minimum of 95 percent of the modified Proctor maximum dry density using ASTM:D-1557 as the standard to raise the grade to the base of the floor section. The floor backfill should consist of free draining sand and gravel. The floor section area should be covered with a minimum 4 inch layer of pea gravel or clean (clean defined as less than 5 percent by weight material passing the No. 200 sieve when measured on the minus ¼ fraction), 5/8th inch crushed rock to act as a capillary break to limit the potential for ground water moisture from wicking through the floor slab. The capillary break layer should then be covered with a plastic moisture barrier and a 2 inch layer of sand placed atop the moisture barrier to aid in the curing of the concrete foundation in accordance with recommendations of the American Concrete Institute (ACI).

Drainage Considerations

A perimeter foundation drain should be established to protect the foundation/floor slab from ground water intrusion. The level of the foundation drain should be set at, or slightly below, the base of the grade beam elevation. The drain should consist of 4 inch diameter, rigid, perforated, PVC drain pipe and should be set to allow for gravity discharge. The drain pipe should be surrounded by a minimum of 6 inches of pea gravel or washed drain rock.. Roof drains should not tie into the footing drain but should be collected in a separate, tightline drain.

Current storm water runoff enters directly into the lake from the roof downspouts and asphalt hard surfaces on the property. We recommend that a square or rectangular, concrete, Type I or II catch basin with a passive oil/water separator consisting of a "tee" on the discharge be installed on this line prior to entering the lake. The tee should be set in a vertical plane such that down-turned portion of the tee extends a minimum of 6 inches below the invert of the discharge pipe and the up turned portion of the tee extends a short distance above the top of the discharge pipe. This type of passive system does not treat potential oil in the catch basin but it does work well to catch and prevent direct discharge of potential lighter than water contaminants. This catch basin should be cleaned and

properly maintained on an as needed basis. This, along with the planned planting plan for the development of the property will improve water quality flowing into the lake from the existing conditions.

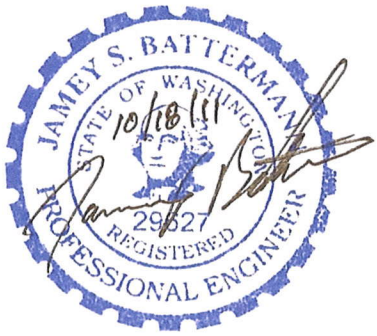
Conclusion

Based on our site reconnaissance and subsurface explorations the site appears to be suitable for the proposed development provided the recommendations presented herein are properly implemented. The proposed replacement of the single family residence will not have an adverse affect on the subject property or on adjacent properties.

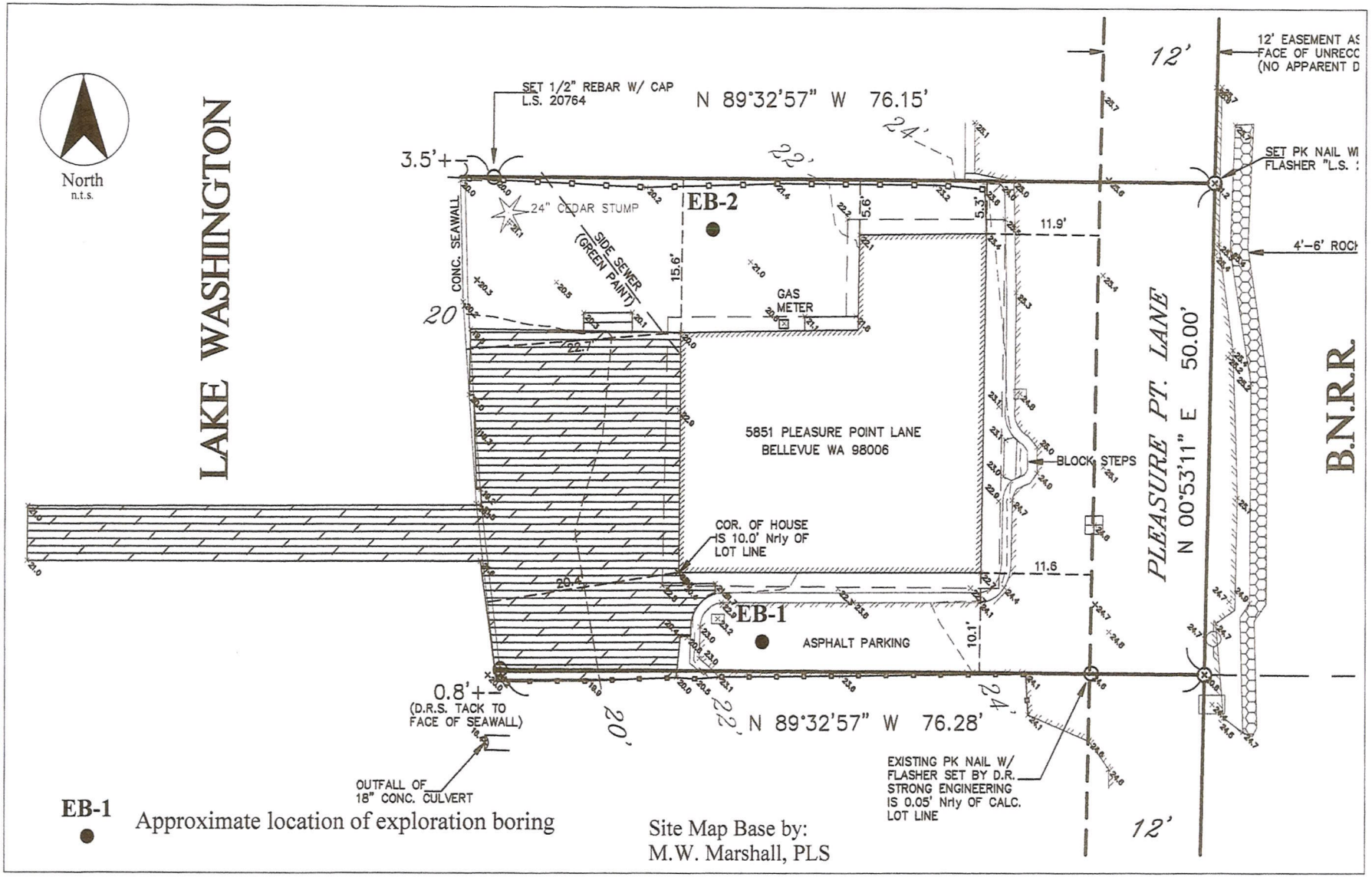
Our findings and recommendations provided in this report were prepared in accordance with generally accepted principles of engineering geology and geotechnical engineering as practiced in the Puget Sound area at the time this report was submitted. We make no other warranty, either express or implied.

We are available to provide additional geotechnical engineering design and consultation throughout the development of this project. We are also available to provide construction monitoring during development of the project for quality control and to help insure that the recommendations contained in this report are properly implemented. We have enjoyed working with you on this project. If there are any questions, please contact us at 425 273-5062.

Sincerely
Battermann Geotechnical Consulting, pllc
Jamey S. Battermann, PE, LG



Attachments: Site and Exploration Plan
Exploration Boring Logs



Battermann Geotechnical Consulting PLLC
BGC, PLLC
14267 209th Avenue NE
Woodinville, WA 98077
(425) 273-5062

Site and Exploration Plan

Jewell Residence
5851 Pleasure Point Lane SE
Bellevue, Washington

Figure 1	Project No: 11001	January 5, 2011

EXPLORATION BORING LOG

Number **EB-1**

SEDIMENT DESCRIPTION	DEPTH	SAMPLE / GROUND WATER	STANDARD PENETRATION RESISTANCE Blows/Foot (10 20 30 40)
Asphalt & Fill Soil, af			
Beach Alluvium, al Brown & grey, moist, gravelly (small gravel) fine to medium sand		2 2 2	4
	5	2 3 4	7
pre-Vashon Fine Grained, Qpff Grey-tan, moist, clayey silt/silty clay		5 6 9	15
Blue grey, moist, clayey silt/silty clay	10	5 9 11	20
Blue grey, moist, clayey silt/silty clay	15	7 11 15	26
Blue grey, moist, clayey silt/silty clay	20	9 18 19	37
BOH @ 21.5 feet No ground water seepage	25		
	30		

Subsurface conditions depicted represent our observations at the time and location of this exploratory hole, modified by geologic Interpretations, engineering analysis, and judgment. They are not necessarily representative of other times and locations. We will not accept responsibility for the use or interpretation by others of information presented on this log.

Battermann Geotechnical Consulting PLLC
BGC, pllc
14267 209th Avenue NE
Woodinville, WA 98077
(425) 273-5062

JEWELL RESIDENCE
5851 PLEASURE POINT LANE SE
BELLEVUE, WASHINGTON
JANUARY 5, 2011
PROJECT No: 11001

EXPLORATION BORING LOG

Number **EB-2**

SEDIMENT DESCRIPTION	DEPTH	SAMPLE / GROUND WATER	STANDARD PENETRATION RESISTANCE Blows/Foot (10 20 30 40)
Fill Soil, af			
Beach Alluvium, al Brown & grey, moist, medium sand with some small gravel		2 3 3	6
pre-Vashon Fine Grained, Qpff Grey-tan, wet, clayey silt/silty clay	5	9 11 14	25
Blue grey, moist, clayey silt/silty clay	10	5 8 10	18
Blue grey, moist, clayey silt/silty clay	15	7 11 16	27
Blue grey, moist, clayey silt/silty clay	20	9 12 18	30
BOH @ 21.5 feet No ground water seepage	25		
	30		

Subsurface conditions depicted represent our observations at the time and location of this exploratory hole, modified by geologic Interpretations, engineering analysis, and judgment. They are not necessarily representative of other times and locations. We will not accept responsibility for the use or interpretation by others of information presented on this log.

Battermann Geotechnical Consulting PLLC
BGC, pllc
14267 209th Avenue NE
Woodinville, WA 98077
(425) 273-5062

JEWELL RESIDENCE
5851 PLEASURE POINT LANE SE
BELLEVUE, WASHINGTON
JANUARY 5, 2011
PROJECT No: 11001

Critical Areas Report

JEWELL RESIDENTIAL SITE DEVELOPMENT PROJECT

Bellevue, Washington

Prepared for:

MIKE JEWELL
1020 88th Avenue NE
Bellevue, Washington 98005

Prepared by:

DAVID EVANS AND ASSOCIATES, INC.
415 – 118th Avenue SE
Bellevue, Washington 98005-3518

January 2012

Critical Areas Report

JEWELL RESIDENTIAL SITE DEVELOPMENT PROJECT

Bellevue, Washington

Prepared for:

Mike Jewell
1020 88th Avenue NE
Bellevue, WA 98005

Prepared by:

Gray Rand
Senior Scientist, PWS

DAVID EVANS AND ASSOCIATES, INC.
415 – 118th Avenue SE
Bellevue, Washington 98005-3518

January 2012

TABLE OF CONTENTS

List of Figures

List of Tables

Appendices

ACRONYMS

Corps	U.S. Army Corps of Engineers
DEA	David Evans and Associates, Inc.
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
ESU	Evolutionarily Significant Unit
HPA	Hydraulic Project Approval
JARPA	Joint Aquatic Resource Permit Application
LUC	Land Use Code
NOAA	National Oceanic and Atmospheric Administration
NWI	National Wetlands Inventory
OHWM	Ordinary High Water Mark
PHS	Priority Habitat and Species
SAS	Seattle Audubon Society
SCS	Soil Conservation Service
USFWS	U.S. Fish and Wildlife Service
WCFWRU	Washington Cooperative Fish and Wildlife Research Unit
WDFW	Washington Department of Fish and Wildlife

1.0 INTRODUCTION

1.1 PROPOSED ACTION AND LOCATION

At the request of Mike Jewell (Client), David Evans and Associates, Inc. (DEA) prepared this Critical Areas Report for proposed demolition and reconstruction of a single family residence on a waterfront lot located at 5851 Pleasure Point Lane SE, along the Lake Washington shoreline in Bellevue, King County, Washington (Section 20, Township 24 North, Range 5 East). The parcel number of the property is 6828100020. The property is a 3,889-square-foot lot with an 890-square-foot single-family home built in 1928. Construction of the new residence would include expanding the footprint of the home to 1,216 square feet.

Figure 1 shows the general vicinity of the proposed project site. Photographs documenting site conditions are included as **Appendix A**.

1.2 PURPOSE

Fifty feet of the western boundary of the lot lies on the shoreline of Lake Washington. The proposed construction would occur within the shoreline buffer and building setback of the lake. This report was conducted on behalf of the Client in their coordination with the City of Bellevue to ensure that it is feasible to demolish and replace a single-family residence on the property despite the presence of critical areas, which are regulated through Section 25.10 of the Bellevue Land Use Code (LUC). The City has notified the applicant that proposed improvements outside the existing foundation footprint will require a Critical Areas Land Use Permit to reduce the shoreline buffer. Preparation of this critical areas report is required to address various portions of the LUC, including LUC 20.25H.230, LUC 20.25H.250, and LUC 20.25H.255.B.

Figure 1: Vicinity Map

Source: King County GIS data

2.0 METHODOLOGY

2.1 BACKGROUND RESEARCH

Background research consisted of a review of published information about local fish and wildlife resources for evidence of critical areas on the subject land parcels. Published information included applicable codes, site plans, and other public domain resource data. DEA reviewed the following information:

- Bellevue LUC 25.25H – Critical Areas Overlay District
- National Wetlands Inventory (NWI) U.S. Fish and Wildlife Service (USFWS), Online Mapper
- A catalog of Washington streams and salmon utilization (Williams et al. 1975)
- Soil Survey – King County Area Washington, 1973, United States Department of Agriculture/Soil Conservation Service (USDA/SCS)
- King County IMAP – Sensitive Areas GIS layers, January 2011

2.2 FIELD INVESTIGATION

A DEA biologist conducted a site visit on January 13, 2011. This investigation was conducted to verify the presence of habitats for species of local importance, including wetlands and streams. No protocol level surveys were conducted for specific species. Photographs of the site taken during the site visit are included in **Appendix A**.

3.0 EXISTING CONDITIONS

3.1 PROJECT VICINITY

The property is located along the eastern shoreline of Lake Washington, Bellevue, King County, Washington (Section 20, Township 24 North, Range 5 East). Land use in the project vicinity is dominated by residential waterfront development, including primarily large single-family houses and associated docks, boathouses, and similar accessories.

3.2 PROJECT SITE

The project site is a 3,889–square-foot lot with an 890-square-foot single-family home built in 1928. The site is bordered by Lake Washington to the west, single-family residential homes to the north and south, and a steep forested hill to the east. The property's total impervious area is 2,398 square feet, which represents 62 percent of the total property surface area. Approximately 1,255 square feet of the impervious area is asphalt and paver block. Very little vegetation exists on the site. The eastern and southern portions of the site are paved with asphalt up to the property boundary. Much of the western portion of the property is covered with wood deck. The northern portion of the property is exposed, unvegetated soil. Vegetation is limited to two ornamental rose bushes and an ornamental shrub in the northeast corner of the property. Because the lot contains a residential structure, it is defined as a developed site by the City of Bellevue (LUC 20.25H.115(B)(1)(a)(i)).

4.0 RESULTS

4.1 WETLANDS AND STREAMS

The NWI (USFWS 2011) shows no wetlands on the project site. During the site visit, DEA identified no wetlands. There were no indications of wetland-associated plant species or wetland hydrology on the property.

The King County Soil Survey (USDA 1973) indicates the project site and vicinity consists of Alderwood and Kitsap soils. These soil series are considered hydric soils (USDA 1990).

One unnamed stream was identified on the property (Williams et al. 1975). The stream is intermittently flowing and is piped under the property before discharging into Lake Washington. Salmon are not known to use the stream. The stream is classified as a Type O stream by the City of Bellevue (LUC 20.25H.075(B)4) . Closed segments of Type O streams do not require a buffer, but do require a 10-foot building setback (LUC 20.25H.075(D)(2)).

4.2 WILDLIFE HABITAT

The subject property provides almost no potential habitat for terrestrial wildlife. The lack of shrubs and trees provides no sources of food or cover. The only habitat on the property that has primary association with species of local importance is Lake Washington, which borders the property to the west. Waterfowl such as mallard (*Anas platyrhynchos*), Canada goose (*Branta canadensis*), and American coot (*Fulica americana*) could use the open water areas of the lake adjacent to the property.

4.3 SHORELINES

Fifty feet of the western property boundary is bordered by Lake Washington. Lake Washington is regulated as a shoreline critical area under Section 20.25E.017 of the LUC. The shoreline across the entire western boundary of the property consists of a concrete wall bulkhead. A wood dock extends approximately 50 feet into the lake. Aquatic substrate at the base of the bulkhead was a mixture of gravel and sand. No aquatic plants were visible at the time of the site visit. Lots to the north and south are similarly developed with vertical bulkheads and structures even closer to Lake Washington.

4.4 SPECIES OF LOCAL IMPORTANCE

Section 20.25H.150 of the LUC designates the following wildlife as species of local importance:

Table 1. Species of Local Importance

Common Name	Scientific Name
Bald eagle	*Haliaeetus leucocephalus*
Peregrine falcon	*Falco peregrinus*
Common loon	*Gavia immer*
Pileated woodpecker	*Dryocopus pileatus*
Vaux's swift	*Chaetura vauxi*
Merlin	*Falco columbianus*
Purple martin	*Progne subis*
Western grebe	*Aechmophorus occidentalis*
Great blue heron	*Ardea herodias*
Osprey	*Pandion haliaetus*
Green heron	*Butorides striatus*
Red-tailed hawk	*Buteo jamaicensis*
Western big-eared bat	*Plecotus townsendii*
Keen's myotis	*Myotis keenii*
Long-legged myotis	*Myotis volans*
Long-eared myotis	*Myotis evotis*
Oregon spotted frog	*Rana pretiosa*
Western toad	*Bufo boreas*
Western pond turtle	*Clemmys marmorata*
Chinook salmon	*Oncorhynchus tshawytscha*
Bull trout	*Salvelinus confluentus*
Coho salmon	*Oncorhynchus kisutch*
River lamprey	*Lampetra ayresi*

The project site provides no wildlife habitat due to its lack of vegetation and none of these species have a primary association with terrestrial habitat on or immediately adjacent to the subject property. Several of these species are unlikely to occur in King County or in the project vicinity, including merlin, western big-eared bat, Keen's myotis, Oregon spotted frog, and western pond turtle (Rodrick and Milner 1991; WCFWRU 2004; Hallock and McAllister 2005).

No suitable nesting, perching, or roosting habitat for eagles exists on or immediately adjacent to the subject property.

Osprey are summer residents in Washington, who nest on large platforms or in large trees, and forage for fish near large bodies of water throughout Puget Sound (King County 2004). There are no documented nest sites near the subject property, but osprey could forage in Lake Washington adjacent to the property at any time.

Both pileated woodpecker and Vaux's swift are closely associated with mature and old-growth conifer forests (King County 2004; Johnson and O'Neil 2001). No habitat for these species exists on the subject property or adjacent properties.

Long-legged and long-eared myotis are both assumed to occur in King County (WCFWRU 2004) and are both known to forage over water, so they could occur over the waters of Lake Washington adjacent to the property. However, there are no suitable roosts or hibernacula for these bat species on or adjacent to the subject property.

Several of the species in **Table 1** are documented to occur in Lake Washington, and may occur in the waters offshore of the project, including common loon, western grebe, Chinook salmon, coho salmon, bull trout, and river lamprey. Common loon and western grebe do not breed on Lake Washington, but are documented as migrants throughout the area (SAS 2011). They could use the waters off the property as loafing or foraging habitat.

Several salmonid species are known to use Lake Washington for migration and rearing, including fall Chinook, winter steelhead, coho salmon, and bull trout. These salmonids do not spawn in Lake Washington. The Puget Sound Evolutionarily Significant Unit (ESU) of Chinook salmon and winter steelhead are listed as threatened by the National Oceanic and Atmospheric Administration (NOAA Fisheries 2011).

Juvenile salmonids are known to occupy the shallow nearshore littoral zone of Lake Washington (Wydoski and Whitney 2003). They use this band of shallow water for feeding, rearing, and as escape from predators. Juvenile salmon may use the nearshore areas adjacent to the property as refuge from predators and as a migratory corridor.

River lamprey spawn and mature in coldwater streams with slow current (Wydoski and Whitney 2003), including the Green River and Sammamish River. Little is known about river lamprey distribution in Washington, but adults have been found in Lake Washington in December (Wydoski and Whitney 2003). They are not expected to utilize the nearshore areas adjacent to the subject property.

5.0 REGULATORY REQUIREMENTS

Part 20.25H of the LUC regulates proposed activities in critical areas through implementation of a Critical Areas Overlay District. Section VIII of Part 20.25H promulgates regulations for habitats associated with species of local importance, which are listed in **Table 1** above. According to Section 20.25H.160 of the LUC, if habitat associated with species of local importance will be impacted by a proposal, the proposal shall implement the wildlife management plan developed by the Washington Department of Fish and Wildlife (WDFW) for such species. Where the habitat does not include any other critical area or critical area buffer, compliance with the wildlife management plan shall constitute compliance with the code.

Section 20.25H.165 of the LUC details the minimum requirements for a Habitat Assessment.

Other pertinent local regulatory requirements include a 25-foot buffer setback for all developed shorelines (LUC 20.25H.035).

Streams are regulated under LUC 20.25H.075. The City of Bellevue does not require buffers for closed segments of Type O streams. However, all closed stream segments require a 10-foot building setback, regardless of type (LUC 20.25H.075(D)2(b)).

Any future proposed activities in or over waters of the State or waters of the U.S. (i.e., Lake Washington) would fall under the regulatory authority of the WDFW, the U.S. Army Corps of Engineers (Corps), and the City of Bellevue. WDFW requires a Hydraulic Project Approval (HPA) prior to any activities in or over Lake Washington (e.g., a dock or rebuilding the bulkhead). Similarly, the Corps requires a Joint Aquatic Resources Permit Application (JARPA) in order to permit any activity below the ordinary high water mark (OHWM) of Lake Washington that falls under their authority under Section 404 of the Clean Water Act.

6.0 PROJECT IMPACTS AND FUNCTIONAL ANALYSIS

The proposed project will not directly or indirectly impact any wetlands or streams. Most of the site is already developed or paved.

The applicant proposes to demolish the existing home on the site and construct a new home with a footprint of 1,216 square feet (**Appendix B**). The proposed layout is similar to the old home, with the major change of moving the bedrooms upstairs to provide for a carport. The residence was originally built in 1928 prior to the need for larger automobile carports and garages, and the access road was not designed to provide for parking. The new house is proposed to "square" off the current layout on the Lake Washington side of the structure, which would have resulted in an additional 45 square feet of intrusion into the 25-foot shoreline buffer. However, the owner has proposed to move the house foundation 1.6 feet farther away from the lake, and extend it slightly to the north and south. The result is that there will be no net increase in structure within the shoreline buffer. The northwest corner of the new structure will be 25 feet from the lake, while the southwest corner will be 21.6 feet from the shoreline. These distances are compared to 22.7 feet and 20.7, respectively, with the existing structure. Similarly, the wood deck will remain unchanged, except that 1.5 feet of deck will be added closer to the house to fill the gap where the house is being moved farther away from the lake. Leaving a small portion of the house inside the buffer is necessary to provide a functional living space while still providing a carport for the house. Removing the house structure from the shoreline buffer completely is not possible for the following reasons:

- Encroaching too close to the roadway easement;
- Leaving enough room for the turning radius of a car to go in and out of the carport;
- Cannot impede traffic on the roadway easement;
- Maintaining a functional living space layout; and
- Maintaining a straight wall along the house's west side to minimize construction cost.

It should be noted that both of the single-family structures adjacent to the north and south of the subject property are closer to Lake Washington than the proposed design.

The proposed project will reduce the amount of permanent foundation structure within the 25-foot shoreline buffer of Lake Washington from approximately 106 square feet with the existing house to a total of approximately 66 square feet with the new house. This continuing impact to the shoreline buffer will be mitigated by removing existing asphalt and structures and planting native vegetation. Overall, the project will result in a net gain of approximately 500 square feet of enhanced shoreline buffer within the 25-foot shoreline buffer. A jacuzzi, shed, and wood decking have already been removed, which has resulted in approximately 150 square feet of shoreline buffer improvements by reducing impervious surface. Additional improvements to water quality and habitat functions on

the site will be accomplished by removing approximately 150 square feet of pollution-generating impervious asphalt along the eastern and southern sides of the residence and replacing it with soil and native plants.

6.1 CONSTRUCTION IMPACTS

Demolition and reconstruction of a house on this site could disturb wildlife in the immediate vicinity during construction activities. For instance, waterfowl resting on the water would likely move to other areas. However, given the high level of ongoing human activity in the area (including waterborne activities such as sailing and water skiing), construction on the site is not likely to generate noise above ambient levels. Other potential short-term impacts from construction could include sediment runoff from the house excavation. If sediment runoff from construction is not fully controlled, it could enter fish-bearing waters (i.e., Lake Washington) and cause behavioral and physiological changes to individual fish, including avoidance, reduced forage success, and increased stress (Bash et al. 2001).

6.2 OPERATION IMPACTS

Following construction of a single-family residence on the property, the primary potential impact of the project on fish and wildlife habitat would be water quality impacts from runoff associated with impervious surfaces on the property. The proposed design will have approximately 2,397 square feet of impervious surface, which is less than the current impervious area. Primary runoff from these surfaces would include roof drainage and driveway runoff. This runoff could have three primary types of impacts: contamination, sedimentation, and temperature. These are described in more detail below.

Contamination

Contaminants can have lethal and sub-lethal physiological affects on salmonids and the invertebrates they feed on. Rapid mortality can result from exposure to toxic substances. Low concentrations can result in sub-lethal effects. For instance, less than one microgram per liter of dissolved cadmium has been shown to have negative effects on aquatic organisms (King County 1999). Ewing (1999) reports that sub-lethal concentrations of contaminants can result in a number of salmonid behavioral effects including the following:

- Increased stress
- Impaired swimming ability
- Interrupted schooling behavior
- Experienced sub-optimal temperatures
- Disrupted normal migration at sea
- Impaired ability to transition from freshwater to saltwater
- Delayed spawning timing
- Predator avoidance

- Inability to spawn
- Rheotaxis

Northwest Fisheries Science Center (2012) has found contaminants in stormwater strongly linked to serious pre-spawn mortality of coho salmon in urban creeks in Puget Sound. Potential sources for contamination from the project would be leaching of chemicals from roof materials, particularly if copper or zinc-treated materials are used, because dissolved zinc and copper have serious impacts to salmonids at low levels. Also, oil, grease, and other compounds from vehicles using the driveway can contribute to contamination in stormwater runoff. However, future vehicle use at the property is anticipated to be the same as current (single-family occupants). Also, a standing seam steel roof is proposed, in lieu of the current asphalt shingle roofing, which will reduce potential hydrocarbon contaminants in roof runoff.

Sedimentation

Sedimentation and turbidity that results from land use activities is recognized as a primary cause of salmonid habitat degradation (Bash et al. 2001). Suspended solids are likely the most damaging stormwater constituent in Puget Sound lowland streams (May et al. 1997). Sedimentation and turbidity are normal occurrences in natural streams and can periodically reach relatively high levels following mass wasting and storm events. However, increases over natural background levels can adversely affect salmonids in a variety of ways (Cramer et al. 1999; Bash et al. 2001) (**Table 2**). High levels of suspended solids may be fatal to salmonids, while lower levels may cause chronic sub-lethal effects such as loss or reduction of foraging capability, reduced growth, resistance to disease, increased stress, and interference with homing and migration cues (Lloyd et al. 1987). Juveniles and eggs appear to be more sensitive to sedimentation and turbidity than do adults (Lloyd et al. 1987).

Table 2: Effects of Sedimentation and Turbidity on Salmonids.

Physiological	Behavioral	Habitat
Gill trauma	Avoidance	Reduction in spawning habitat
Osmoregulation	Territoriality	Effect on hyporheic upwelling
Blood chemistry	Forage and predation	Damage to redds
Reproduction and growth	Homing and migration	

Source: Bash et al. 2001

Sedimentation from the proposed project would only be a concern during construction. Construction runoff will be sufficiently managed with correct implementation of best management practices and recommended mitigation measures (see Section 7.0 below).

Temperature

Salmonids require cool water to survive (**Table 3**). However, because salmonids are able to avoid and tolerate adverse thermal conditions to some degree, optimal temperatures do not have to occur throughout their range at all times (EPA 2001). Fish respond to temperature variations through physiological and behavioral adjustments that are dependent on the magnitude and duration of exposure (Sullivan et al. 2000).

The temperature at which death to salmonids occurs within minutes ranges from 27 to 30 degrees Celsius (Jobling 1981). Mortality can occur at lower temperatures when exposures are of longer duration. Temperatures above 23 degrees Celsius (73.4 degrees Fahrenheit) are lethal to salmonids, and genetic abnormalities or mortality to salmonid eggs can occur above 11 degrees Celsius (51.8 degrees Fahrenheit) (Ecology 2000). The elevation of water temperatures to these lethal limits will result in salmonid mortality.

Table 3: Optimal Temperature Limits for Bull Trout.

Life Stage	Temperature Limit
Spawning, Incubation, and Juvenile Rearing	Summer, single daily maximum: <12°C (53.6°F)
Migratory Populations	Daily maximum: <12°C (53.6°F)

Source: EPA, 2001

Exposure to elevated temperatures that do not reach lethal limits and exposure to lethal temperatures for short durations can have a variety of non-lethal, negative affects on salmonids. Ecology (2000) reports the following effects to salmonids that result from increased water temperatures:

- Decreased dissolved oxygen levels
- Disrupted metabolism
- Increased susceptibility to toxins
- Increased vulnerability to disease
- Reduced ability to avoid predators
- Reduced food supply

Any increased runoff generated by the proposed project would have no significant effect on the water temperature of such a large body of water as Lake Washington.

6.3 FUNCTIONAL ANALYSIS

According to Section 20.25H.230 of the LUC, where "the proposal involves restoration of degraded conditions in exchange for a reduction in regulated critical area buffer on a site, the critical areas report must demonstrate a net increase in certain critical area functions."

The proposed project will result in a 40-square-foot reduction in the permanent structure footprint within the 25-foot shoreline buffer. This will enable functional space and a straight line foundation on the west wall of the residence.

Current Functions and Values of the Shoreline Buffer

The existing shoreline buffer provides virtually no natural biological support for the aquatic environment of Lake Washington. No native vegetation is currently present within the 25-foot shoreline zone, and only a small area is without impervious surface. No shade is present off the bulkhead to the nearshore aquatic zone, no detritus input is provided by shoreline vegetation, and there is no water quality treatment for stormwater runoff from impervious surfaces.

Functions and Values Under the Proposed Future Conditions

Once the proposed project is constructed, there will be approximately 300 square feet of native vegetation planted within the 25-foot shoreline buffer, consisting of a mixture of herbaceous plants and shrubs. Also, there will be approximately 150 square feet of asphalt and pavement removed on the south side of the house (outside the 25-foot shoreline zone) and replaced with pervious surface. Installation of native vegetation will raise the percentage of the lot occupied with native plants from zero to eight percent. Increasing plant diversity and structure on the site will improve aquatic habitat in Lake Washington by increasing shade along the bulkhead, increasing detritus input, and providing wildlife habitat. Decreasing impervious surfaces, combined with the proposed water capture system and use of less polluting roof material, will reduce potential contaminant loading into Lake Washington. Once construction of the proposed project is complete, there will be a significant improvement in the net biological function of the shoreline buffer on the site compared to existing conditions. A planting plan worksheet is provided in **Appendix C** showing the plant species and proposed layout in the shoreline buffer planting areas.

Variance for Type O Piped Stream

The 10-foot building setback on the Type O piped stream adjacent to the subject property will have a minor encroachment under the proposed site plan. In the southeast corner of the house, the foundation will be approximately 9 feet from the pipe and the roof line will be 7 feet from the pipe, instead of the required 10 feet. This encroachment will have no effect on the aquatic functions of the stream. No riparian buffer currently exists on this stream, and there is no interaction between the water in the pipe and the terrestrial environment on the subject property. Therefore, encroachment into the building setback will in no way negatively affect the ecological functions of this stream.

7.0 RECOMMENDED AVOIDANCE, MINIMIZATION, AND RESTORATION MEASURES

The following measures are recommended to minimize potential water quality impacts during construction:

- Installation and maintenance of a reinforced silt fence (i.e., plastic silt fence reinforced with wire and anchored with fenceposts) at the edge of the construction limit to prevent sediment from entering Lake Washington.
- Use of straw, wattles, and coir bales wherever appropriate to protect exposed dirt.

In addition to these measures, the following measures are recommended to restore and enhance shoreline habitat:

- Plant with native plants as shown in **Appendix C** to create approximately 300 square feet of enhanced shoreline buffer and provide improved water quality functions, detritus input, shade, and cover to fish.
- Replace asphalt with pervious surface in approximately 150 square feet of the lot outside the shoreline buffer.
- Avoid use of roof materials or treatments (e.g., roof washes) infused with copper and zinc; and
- Avoid use of chemical fertilizers, pesticides or herbicides within the shoreline buffer.

7.1 MAINTENANCE AND MONITORING

Per LUC 20.25H.220, the shoreline restoration area must be monitored for a period not less than three years to ensure planting success. The monitoring program shall measure the success of the restoration using the following specific, measurable performance standards:

- Survival of all native trees and shrubs in the planting areas will be 100 percent one year after installation. If 100 percent survival is not achieved, plants will be replaced.
- Survival of all native trees and shrubs in the planting areas shall be 80 percent by the end of the third year of monitoring.

Given the relatively small number of plants involved in the restoration, monitoring should consist of a complete count of all plants at the end of Year 1, and again at the end of Year 3. Monitoring methods will include photographs of the planting areas to document plant development. Incidental observations of wildlife use of the mitigation site will be included. A monitoring report

documenting the condition of the restoration areas and attainment of the performance standards will be prepared and submitted to the City of Bellevue at the end of Year 1 and Year 3.

Maintenance within the planting areas will be performed annually as needed by the owner or the owner's representative. Maintenance tasks may include replacement of failed plantings, temporary irrigation, trash removal, and invasive plant removal.

Per LUC 20.40.290, the City may require a performance security to ensure performance of the proposed restoration. This security can be waived in situations where it is reasonably certain that the applicant will be able to complete the improvements within a certain amount of time or when the granting of a temporary occupancy permit prior to the completion of work will not be materially detrimental to the City or properties in the vicinity of the subject property. The amount of the performance security is required by LUC 20.40.490(D) to be 150 percent of the cost of the proposed improvements. Estimated costs for the shoreline restoration are listed below:

Materials (plants, topsoil, mulch) and Installation	$1100.00
Mobilization and Contingency -	$400.00
Total Performance Bond (150% of estimate)	**$2250.00**

8.0 REFERENCES

Bash, J.C. Berman, and S. Bolton. 2001. *Effects of turbidity and suspended solids on salmonids.* Center for Streamside Studies, University of Washington.

Cramer, S.P., J. Norris, P.R. Mundy, G. Grette, K.P. O'Neil, J.S. Hogle, C. Steward, P. Bahls. 1999. *Status of Chinook Salmon and their Habitat in Puget Sound – Volume 2 Final Report.* S.P. Cramer and Associates, Inc. Gresham, Oregon.

Ewing, R.D. 1999. *Diminishing Returns: Salmon Decline and Pesticides.* Oregon Pesticide Education Network.

Hallock, L.A. and K.R. McAllister. 2005. Oregon Spotted Frog. Washington Herp Atlas. Visited on May 28, 2007. http://www.dnr.wa.gov/nhp/refdesk/herp/

Jobling, M. 1981. *Temperature Tolerance and the Final Preferendum – Rapid Methods for the Assessment of Optimum Growth Temperatures.* In: Sullivan, K.; D.J. Martin; R.D. Cardwell; J.E. Toll; S. Duke. 2000. An Analysis of the Effects of Temperature on Salmonids of the Pacific Northwest with Implication for Selecting Temperature Criteria. Sustainable Ecosystems Institute. Portland, Oregon.

Johnson, D.H. and T.A. O'Neil (man. dirs). 2001. *Wildlife-Habitat Relationships in Oregon and Washington.* Oregon State University Press.

King County. 1999. *Small Streams Toxicity/Pesticide Study – 1999.* King County Department of Natural Resources and Parks, Water and Land Resources Division.

King County. 2004. Best Available Science – Volume 1 – A Review of Science Literature. King County Executive Report, February 2004. Available at http://www.metrokc.gov/ddes/cao/#best

Lloyd, D.S., J.P. Koenings, J.D. LaPerriere. 1987. *Effects of turbidity in freshwaters of Alaska.* North American Journal of Fisheries Management. 7: 18-33.

May, C.W., E.B. Welsh, R.R. Horner, J.R. Karr, and B.W. Mar. 1997. *Quality Indices for Urbanization Effects in Puget Sound Lowland Streams.* Final Report for the Washington Department of Ecology. Water Resources Series Technical Report No. 154. Olympia, Washington.

NOAA Fisheries. 2011. Endangered Species Act Status of West Coast Salmon and Steelhead. Updated July 1, 2009. http://www.nwr.noaa.gov/ESA-Salmon-Listings/upload/snapshot-7-09.pdf.

Northwest Fisheries Science Center. 2012. Acute die-offs of adult coho salmon returning to spawn in restored urban streams. NOAA Fisheries Service. Project summary available at http://www.nwfsc.noaa.gov/research/divisions/ec/ecotox/fishneurobiology/acutedieoffs.cfm.

Rodrick, E. and R. Milner. 1991. *Management Recommendations for Washington's Priority Habitats and Species.* Washington Department of Fish and Wildlife, Wildlife Management, Fish Management, and Habitat Management Divisions.

Seattle Audubon Society. 2011. Birdweb. http://www.birdweb.org/birdweb/index.aspx.

Sullivan, K., D.J. Martin, R.D. Cardwell, J.E. Toll, and S. Duke. 2000. An Analysis of the Effects of Temperature on Salmonids of the Pacific Northwest with Implication for Selecting Temperature Criteria. Sustainable Ecosystems Institute. Portland, Oregon.

U.S. Department of Agriculture (USDA). 1973. *Soil Survey King County Area.* Soil Conservation Service. Washington, D.C., U.S. Government Printing Office.

———. 1990. *Washington Hydric Soil List (Updated 11-20-90).* Soil Conservation Service. Spokane State Office, Washington, U.S. Government Printing Office.

U.S. Environmental Protection Agency (EPA). 2001. *Draft – EPA Redion 10 Guidance for State and Tribal Temperature Water Quality Standards.* Environmental Protection Agency.

U.S. Fish and Wildlife Service (USFWS). 2011. National Wetlands Inventory online mapper. Accessed at http://www.fws.gov/wetlands/Data/Mapper.html. on January 17, 2011

Washington Cooperative Fish and Wildlife Research Unit (WCFWRU). 2004. *The Washington GAP Analysis Home Page.* URL: http://www.fish.washington.edu/naturemapping/results.html

Washington State Department of Ecology (Ecology). 2000. *Focus – Effects of Elevated Water Temperatures on Salmonids.* Washington State Department of Ecology. July. Focus Number 00-10-046.

Williams, R.W., R.M. Laramie, and J.J. Ames. 1975. A catalog of Washington streams and salmon utilization. Washington Department of Fisheries, Olympia, Washington.

Wydoski, R.S. and R.R. Whitney. 2003. *Inland Fishes of Washington.* American Fisheries Society in association with the University of Washington Press. 320pp.

APPENDICES

APPENDIX A:

Site Photographs

Figure 1. Southern side of the residence, from Pleasure Point Lane SE facing west. A portion of this area would have native plants installed under the proposal.

Figure 2. East side of the house on Pleasure Point Lane SE.

Figure 3. Existing vegetation in the corner. This area would receive native plantings under the proposal.

Figure 4 Exposed soil on the north side of the house.

Figure 5 Back yard of the house, from the dock facing east.

Figure 6 Unnamed stream, entering a catch basin on Pleasure Point Lane SE.

Figure 7 Outlet in Lake Washington of the closed section of the unnamed stream.

APPENDIX B:

Jewell Residence Site Plan

APPENDIX C:
Plant Legend and Planting Plan Worksheet

PLANT LEGEND & PLANTING PLAN WORKSHEET

How to draw your planting plan and legend:

Step 1: Sketch your restoration area on the grid paper on the back of this page.

Step 2: Determine which plants you are going to use. Use the template you have picked out as a guide and add your own from the *Master Plant List* in *Appendix C* if you feel comfortable.

Step 3: Draw a simple symbol for each plant, such as a circle with a letter in the middle. Put each symbol in the legend table below. Write down the name of each plant.

Step 4: Return to your new knowledge of mature plant size, spacing, density and cost. Use these criteria to help layout your plants.

Step 5: Lay out the trees **first**. Make sure to give them enough space.

Step 6: Now lay out the shrubs. Group them together in clusters according to species. Remember the school photo rule - Tall plants in the back, short plants in the front.

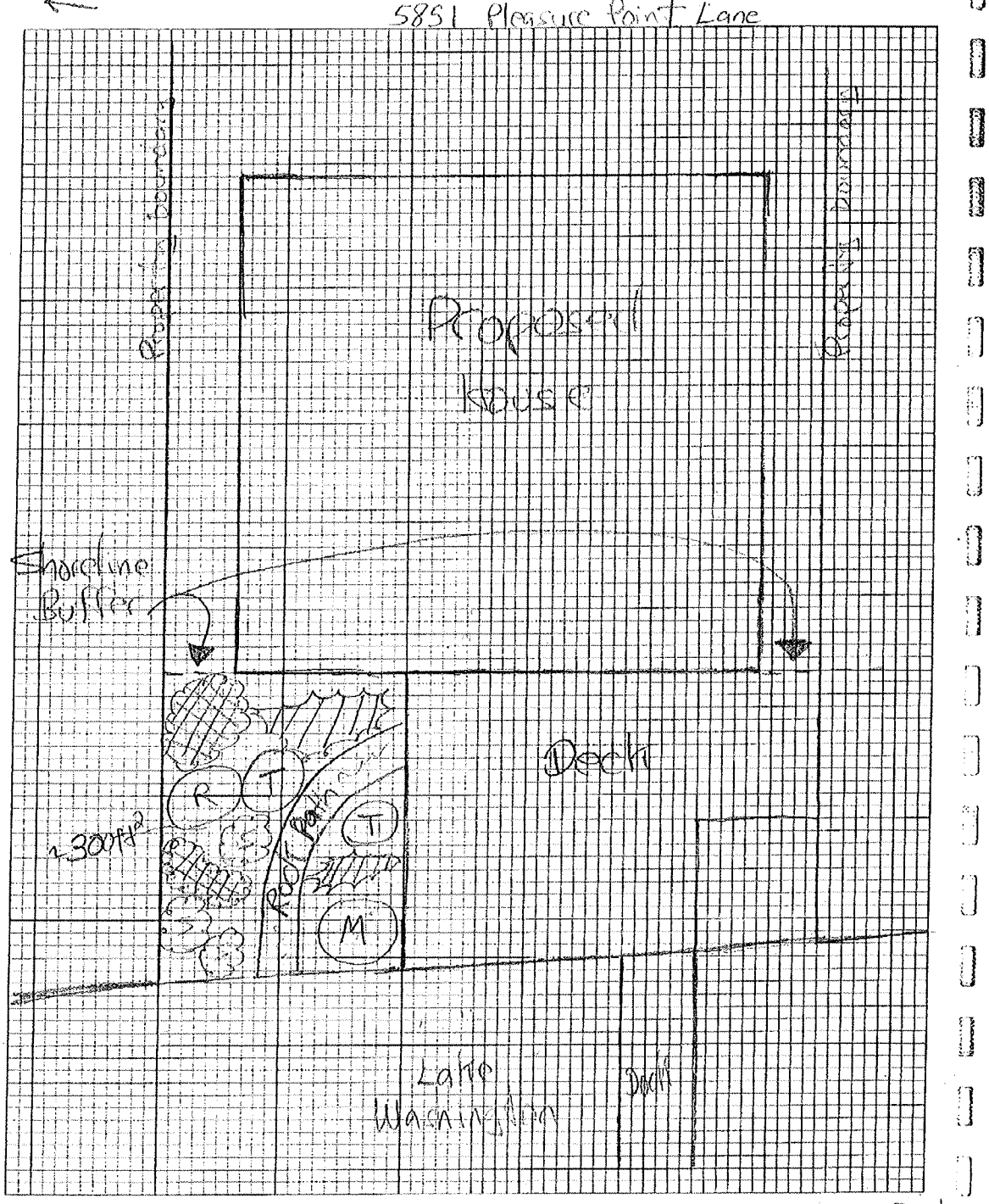
Step 7: Now add in the groundcover and perennials. Use these to fill in around the trees and shrubs.

Step 8: Count up the number of plants and put a total in the Qty. (Quantity) column for each plant species.

Symbol	Name	Size	Qty.
(M)	Mock orange	8'	1
(T)	Thimbleberry	8'	2
(R)	Clustered rose	5'	1
(S)	Snowberry	5'	3
	Strawberry	24" o.c.	Various
	Tufted hairgrass	24" o.c.	Various

Symbol	Name	Size	Qty.

PLANT LEGEND & PLANTING PLAN WORKSHEET



Notes: Lot and house layout approximate **Scale:** 1inch = 10 feet

PP-2